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D.F. Stevens

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When is Chargeback Counterproductive?*

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When is Chargeback Counterproductive?¹

Introduction

Fifteen years ago it was understood that the proper way to manage computing was to provide a free service in which suitable portions of the available resources (CPU time, disk space, application development and support, etc.) were allocated to individual groups or specific applications by a central authority. This process seems to have arisen from a desire to achieve and maintain rather tight control over the ADP monster. Today, partly because of the desire to reduce the famous applications logjam, and partly because of the growing popularity of the distributed-profit-center philosophy, one hears with increasing frequency that the proper way to manage computing is to charge its costs back to the using groups. It is unlikely that the old style of management caused the applications backlog, and it is equally unlikely that the new style will cure it; it is also unlikely that the profit-center philosophy is suitable for all corporations in all situations. It is suggested here that the chargeback decision is a rather fundamental one, and instead of plunging reflexively in either direction one should make a reasoned choice based upon the rôle of computing in the corporation, of the nature of the computing environment within the corporation, and of the philosophical basis for the organization of the corporation².

Why, if such an impartial approach is advocated, does article bear such a one-sided title? Because chargeback is the fashion of the moment, and one can find many rationales for chargeback in the current trade press. Balance can best be preserved in this case by emphasizing the negative.

When is chargeback counterproductive?

Before attacking this question directly it is useful first to answer four preliminary context-setting questions:

- What is chargeback?
- Why implement it?
- What alternatives are there?
- What do we mean by counterproductive?

The last of these is the simplest: *Anything that interferes with the optimal use of the corporate computing resource is counterproductive.* "Optimal use" is here taken to mean the timely, competent, and cost-effective implementation of the right applications, and is to be applied in a global (corporate-wide) sense.

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² Corporation is used here in a generic sense to refer to any organization, commercial or otherwise, that habitually uses computing.
Counterproductive activity includes any administrative actions that foster suboptimal use of the corporate information services (IS) resources. To the extent that chargeback encourages suboptimization, it is counterproductive.

In simple-minded terms, the alternatives to chargeback are free access (to unlimited resources), allocation (of limited resources), and subsidy. (Free access to limited resources can also be tried, of course, but in most organizations of any size such a policy will generally lead to an unpleasant free-for-all; some form of allocation soon becomes necessary to prevent vicious internecine warfare.) Free access and allocation are chargeless, in the sense that whatever charges exist are buried so deeply in corporate overhead accounts that they are never seen by the end users. They differ in the amount of central control that exists. Subsidy and chargeback are both charged, in the sense that the charges are visible to the using population. They differ in the type of algorithm used: Chargeback is based upon usage, whereas subsidy is based upon such usage-independent factors as headcount or budget. (Subsidy is in effect a tax on the rest of the organization to support the DP/IS establishment.) Note that these are not disjoint alternatives: Free (in the sense of unlimited) access and allocation are two ends of the access-control spectrum, and some mixture of these two modes applies in every case. Similarly, free (in the sense of no-cost) access is one end of the visible cost spectrum, with subsidy and chargeback sharing the other end. Nevertheless, one mode is usually dominant in any given organization, to the extent that it is perceived as the only mode.

A number of reasons for chargeback have been given in the literature, including:

- to distribute [fairly? rationally?] the cost of operating the DP/IS facility
- to influence user behavior
- to control the use of information resources
- to increase the accountability of the DP/IS facility
- to control the DP/IS function

You will note that to promote optimal use of DP/IS resources is not included in this list. That is due, at least in part, to the fact that that is a strategic objective, while the given reasons are tactical. In the absence of detailed knowledge of a specific situation it cannot be said whether any one of these tactics supports or opposes the optimal use of computing resources.

How do the alternatives to chargeback compare with chargeback and with each other in the light of these reasons? As one would expect, chargeback addresses them all, free access addresses none of them, and allocation and subsidy occupy different portions of the middle ground (see Table 1, on the next page).

What is chargeback? It is defined as payment for DP/IS services rendered. In today's corporate world, however, many forms of payment are possible, not all of which are suitable for chargeback. To control the use of information resources, one must either control or influence the users. For a chargeback scheme to
Alternative

To distribute the cost of operating the DP/IS facility
To influence user behavior
To control the use of information resources
To increase the accountability of the DP/IS facility
To control the DP/IS function

Table 1: Effectiveness of Management Alternatives for Certain Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Alternative</th>
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<tbody>
<tr>
<td>To distribute the cost of operating the DP/IS facility</td>
<td>n Y Y Y</td>
</tr>
<tr>
<td>To influence user behavior</td>
<td>n Y n Y</td>
</tr>
<tr>
<td>To control the use of information resources</td>
<td>n Y n Y</td>
</tr>
<tr>
<td>To increase the accountability of the DP/IS facility</td>
<td>n n n Y</td>
</tr>
<tr>
<td>To control the DP/IS function</td>
<td>n n Y Y</td>
</tr>
</tbody>
</table>

(F = free access; A = allocation of resources; S = subsidy; C = chargeback)

exert any influence over the users, the medium of exchange must be in limited supply. To increase the accountability of the DP/IS facility, it is useful to increase the visibility of its costs by passing them in some form on to the users. To distribute the cost of operating the DP/IS facility and to assist in the control of the DP/IS function, there must be a direct correlation between chargeback income and the budget of the facility. All of the control functions of the chargeback mechanism are enhanced if the medium of exchange is directly usable in other places (including outside the organization) and for other purposes, and if it has no expiration date.

It should be clear by now that the ideal medium of exchange is real money. It may be less clear why it has been necessary to justify this conclusion. The fact is that there are many organizations that use some other form of chargeback, such as budgetary currency that expires at the end of a fiscal year, or internal “funny money” that is usable for only certain services and is completely unspendable outside the corporation. To the extent that the medium of exchange is less flexible and universal than real money it is less able to accomplish the purposes for which chargeback is instituted.

We are now able to rephrase the title question in more accessible terms:

When is the transfer of real currency to pay for DP/IS services (chargeback)
inimical to the globally optimal use of the corporate DP/IS resource (counterproductive)?

and to examine the factors that should be considered when making the chargeback decision. As a final prelude to looking at the decision elements, however, it is useful to look first at two consequences and one non-consequence of the decision. That is because the decision is often made in ignorance of these consequences, and in defiance of the non-consequence. The intent, by the way, is not to advocate a specific choice, but to provide some additional background to assist in the making of a rational decision.
C1. Chargeback encourages underuse; free access, allocation, and subsidy encourage overuse

(Note that none of the alternatives a priori encourages optimal use.) The first half of C1 is self-evident; a would-be charge user with a finite budget will think twice before implementing an unnecessary application, and will skimp on the implementation of even necessary ones. On the other hand, since allocations tend to be tied to historical usage, a would-be allocation user will get as many applications into the queue as possible in order to preserve or expand his or her share of the resources. And if allocations are tied to projections rather than to history, the cautious user will project a safety margin in order to ensure that an adequate allocation is awarded to handle the nearly-necessary as well as the necessary, and will always have some niceties to put into the queue, just in case. Similarly, users subject to subsidy tend to think that since the charge is independent of use, the more they use, the cheaper it is. Free access suffers from the human tendency to equate value with cost. A free resource is thought to have little value. With both subsidy and free access there is little direct incentive to use DP/IS resources wisely or with restraint.

C2. Chargeback favors the rich; allocation and subsidy favor the influential; free access favors the local, the energetic, and the technically inclined

(Note that none of them favors the needy.) Under a chargeback system, the rich users buy up the resource and the poor users are left with fragments of interstitial time (background, nights, and weekends). Under an allocation system, the influential users get the prime service, and those who are out of favor get the interstices. Because there is always suppressed demand, the acquisition of additional capacity will benefit the disenfranchised for only a brief period until the more favored community has reacted to the situation and increased its demands so as to exhaust the supply. Subsidy also aids the influential, but by lowering their costs rather than by making their computing more convenient; they use their influence to tailor the basis and administration of the subsidy to their advantage. Under free access, those who can reach the system most easily will reap the greatest benefit. (Neither allocation nor subsidy is a clear-cut case. Wise application of either system, in fact, could benefit the needy, but the long view of history suggests that politics eventually subvert any noble motive; the result is that both subsidy and allocation will eventually be twisted in favor of the influential.)

NC. Chargeback does not eliminate the backlog; it just distributes it

This non-consequence depends upon what one means by backlog, of course. If backlog is defined strictly as that set of applications, the implementation of which has been formally requested of a central application development group but not completed, then perhaps chargeback will reduce
it. But if, as makes more general sense, the true backlog is considered, namely all those applications that the users would like to see on the system, but which have not been implemented or installed, then all chargeback does is take the single, visible queue that exists in most allocation and subsidy shops and replace it with a large set of invisible queues, one per user, each of which contains those applications that the user does not choose to pay for just yet. It is very likely that the sum of these invisible queues is far larger than the visible allocation queue. It is not clear, however, which system creates the greater discontent among the user community. Free access can reduce the backlog, but only in the presence of unlimited resources -- including system development talent. Such a Utopian situation, alas, is rare indeed.

We are now ready to consider the factors upon which the chargeback decision should be based.

F1. Essentaility: Nice or necessary?

Some corporations depend upon computer processing in an essential manner; others rely upon computers only for the convenient processing of inessential operations. In those cases where the use of computing resources is a nicety rather than a necessity, it makes sense to treat them in the same manner as any other optional resource. Chargeback mechanisms are rational in such situations for they encourage the careful weighing of costs and benefits. On the other hand, the more necessary the use of a computer is to the success of the corporation, the more necessary it is to remember the first of the Consequences noted above: It is not in the corporate interest to discourage the use of an essential tool.

F2. Use: Production or exploration?

A computer application that is categorized as production is one that takes place in a known universe: It is repetitious, and its resource requirements are known, as is its operational behavior. The predictability of such applications makes chargeback reasonable, because there is enough advance information to allow meaningful planning to be done, both by the user and by the supplier of the computing resource. The opposite of a production application is an exploratory application, which takes place in an ill-defined universe. Even the meaning of end of project and success may not be known in advance, or may be redefined in the course of the project. Instead of being repetitious, the operational behavior of such applications is quite free-form; the sequence of operations often depends upon the results of preceding operations and cannot be predicted in advance, except within very broad limits. Many interactive investigations are typical of this type of application. Chargeback discourages open-ended experimentation more than it discourages production use, because the potential costs of such applications are likewise open-ended. They (exploratory applications) tend to be better served by any of the other alternatives than by chargeback.
F3. DP/IS rôle: Profit-center or support function?

Since the profit-center idea is meaningless in the absence of a mechanism for making a profit, chargeback is absolutely necessary if the DP/IS facility is to be considered as a profit center. It may seem on the face of it that there is no inherent conflict between the profit-center and service/support rôles for DP/IS and, in fact, many DP/IS organizations are expected to perform both. But if the DP/IS organization is evaluated as a profit center -- even if the desired profit is exactly zero -- then the achievement of that goal interferes with the provision of service. The stronger the motivation to increase the profit margin, the stronger the motivation to cut expenses (and hence also the kinds or extent of service that is offered) or to raise prices. Some of the most important service functions -- particularly those involving the free access of users to DP/IS experts -- are among the most expensive. They are therefore among the first to be priced out of reach or to vanish in the face of "budgetary reality". If service is to be paramount, chargeback is contraindicated.

F4. Financial expectations with respect to DP/IS: Self-sufficient or dependent?

This is closely related to F3, of course, for unless DP/IS has a source of income it cannot be financially self-sufficient. In deciding whether, or how, to institute chargeback it is necessary to consider who is currently supporting the DP/IS facility, how that support is administered, whether it is general or limited to specific portions of the budget, what the supporting organization receives in return for its support (and what it expects to receive), what sort of favored-user status it enjoys as a result of that support, how important it is that it remain so favored, and a host of similar questions. Self-sufficiency requires chargeback, and under chargeback, the most favored user is the one that chooses to spend the most money with the DP/IS facility. Organizational loyalty is replaced by fiscal loyalty, and global priorities become subordinated to local priorities. If there is good reason for the DP/IS function to remain financially dependent, there is good reason to avoid chargeback.

F5. User independence: Captive or free?

Chargeback can be viewed as a giant step towards self-sufficiency, and hence maturity, on the part of the DP/IS facility. It can also be viewed as a step towards intelligent and proper use of computing resources, and hence maturity, on the part of the users. Unless the users have the freedom to choose their source of computing, however, the self-sufficiency of the DP/IS facility is illusory, for it is existing in a protected environment. Similarly, one aspect of intelligent and proper use of computing resources is the intelligent selection of the source of computing, which cannot occur where no choice is possible. Chargeback, then, is philosophically consistent with freedom of choice for the users. (It should be noted that true freedom of choice includes not only the freedom to go outside the corporation, but also to set up independent -- and
possibly competing -- DP/ISlets; the determination of a globally optimal computing strategy in such situations can become exceedingly difficult.)

Chargeback is not philosophically consistent with captive or constrained users. (In fact, if the users have no freedom of choice, a "chargeback" algorithm is really a usage-based subsidy.) The fact of chargeback, as noted above, encourages the users to exercise restraint with respect to the consumption of computing resources; the requirement that they use the corporate DP/IS facility, on the other hand, allows the facility to disregard restraint with respect to its consumption of the users’ resources. Such philosophical imbalances are cause for resentment, at the very least.

F6. Programming environment: Open shop or closed shop?

Most open-shop programmers, by definition, are not members of the DP/IS establishment, and these days they are often not even DP/IS professionals. Their primary loyalty is to the group for which they work, and their primary objective is completing the job. When job completion is foremost, other objectives, including resource conservation, suffer. An open-shop environment is thus a good environment for chargeback, at least if the chargeback algorithm encourages resource conservation. The other side of the coin is that, in a chargeback situation, the DP/IS operating income depends upon the consumption of computing resources. Having the programming team restricted to DP/IS staff is therefore akin to setting the fox to guard the chickens. In view of such a fundamental conflict of interest, closed-shop programming and chargeback are fundamentally incompatible.

F7. Corporate power structure: Distributed or centralized?

and

F8. Corporate data control: Distributed or centralized?

These two factors are clearly related, but they are not identical: There are many organizations with a centralized power structure and distributed data control, as well as some with strongly centralized data control even in the midst of a decentralized corporate power structure. In both cases, but for somewhat different reasons, distribution favors chargeback and centralization does not. In the case of the corporate power structure, the more widely it is distributed, the more likely it is that a free-market approach to computing, including chargeback, will be taken. By their very nature, allocation and subsidy demand a willingness to accept a central authority; the exercise of such authority in one area is more acceptable if authority in other areas is also centralized.

In the case of data control, the link to the chargeback decision is not direct, but via the programming environment. Distributed data control implies some level of distributed application development, which in turn implies a greater likelihood of an open-shop programming environment. The more necessary it is
that there be strong central control of some corporate data, the more likely it is that at least some applications will exist in a closed-shop environment. A need for centralized data control thus argues against chargeback.

F9. Corporate culture

"Corporate culture" refers to the collection of philosophies and practices that determine the manner in which a corporation really operates (sometimes in defiance of its formal written procedures and structures). While some of the preceding discussion has cultural implications, it is not concerned with the impact of overall corporate culture on the chargeback decision. Historically, computing questions seem to generate more emotional responses than do other questions. It is more true of computing than of many other aspects of corporate life that a rational decision is not necessarily a correct decision. (A correct decision is one that will receive corporate support and have some chance of achieving the desired objectives, regardless of the pure logic of the situation.) When this effect is combined with the emotionally-charged question of payment, cultural effects come very strongly into play.

Corporate culture can be characterized as a function of five dimensions (see Table 2, below): Willingness to take risks, lines of authority, internal relationships, style of direction, and morality. Where the corporation sits on each of these dimensions has some bearing on the likelihood that a chargeback scheme will be a success in the organization.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Tendencies</th>
<th>Tendencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anti-chargeback</td>
<td>Pro-chargeback</td>
</tr>
<tr>
<td>Willingness to take risks</td>
<td>entrepreneurial</td>
<td>conservative</td>
</tr>
<tr>
<td>Lines of authority</td>
<td>ambiguous</td>
<td>clear</td>
</tr>
<tr>
<td>Internal relationships</td>
<td>cooperative</td>
<td>competitive</td>
</tr>
<tr>
<td>Style of direction</td>
<td>leadership</td>
<td>management</td>
</tr>
<tr>
<td>Morality</td>
<td>amoral</td>
<td>ethical</td>
</tr>
</tbody>
</table>

Table 2: Dimensions of Corporate Culture

sits on each of these dimensions has some bearing on the likelihood that a chargeback scheme will be a success in the organization.

F9.1: Willingness to take risks: (This dimension is the one that relates most directly to the chargeback decision; the relationship in all of the other cases is rather diffuse.) Conservative corporations emphasize

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3 This characterization of corporate culture is based upon that given in Harnessing Corporate Culture, by Jane Linder, appearing in the September 23, 1985 issue of Computerworld.
fiscal responsibility, the importance of knowing the costs before embarking upon the journey. They are clearly the ideal home for chargeback mechanisms. Entrepreneurial corporations, on the other hand, encourage exploration. As we have seen before, the exploratory uses of computing are incompatible with chargeback.

**F9.2: Lines of authority:** (Note that the range of variation is not central vs. distributed, but clear vs. ambiguous.) Chargeback is more comfortable in organizations with clear lines of authority primarily because any activity involving the exchange of money is going to create some bitter disputes. An organization with clear lines of authority is more capable of establishing an acceptable mechanism capable of resolving such disputes. Organizations with ambiguous lines of authority provide more scope for politics, and hence are more comfortable with any of the alternatives to chargeback.

**F9.3: Internal relationships:** Cooperative internal relationships tend to obviate the need for the DP/IS function to "pay its own way", and so are consistent with non-chargeback situations. Similarly, competitive internal relationships are consistent with the profit-center philosophy, and hence with chargeback.

**F9.4: Style of direction:** The principal distinction between corporations that are led and those that are managed seems to be in the length of the administrative perspective: "leadership" is long-range and "management" is short-range. There would thus tend to be a bias towards chargeback, with its instant recovery of costs, in managed corporations.

**F9.5: Morality:** Morality is a fuzzy area, in this as in many other discussions. One can argue (cynically) that any decision is acceptable to an amoral corporation, because the amoral will work any system to their own advantage. One can argue (ingenuously) that any decision is acceptable to an ethical corporation, because the ethical will strive to see that any (ethical) decision is upheld. My principal reason for listing the amoral extreme as anti-chargeback is that the stakes tend to be greater in a chargeback game, making it more worth subverting, and to that extent it is likely to divert the energies of the corporation towards internal targets instead of towards external competition.

**F10: Cost of implementation and operation**

Chargeback costs more to implement and operate than any free access scheme, or any reasonable subsidy or allocation scheme. Recharge rates must be individually justified. Accurate records must be kept of usage, of charges and receipts, and of refunds (especially of refunds). Computing resources as well as human resources are consumed by these efforts. Furthermore, recharge schemes tend to grow in complexity as the users learn to defeat the simple schemes, and operational costs grow exponentially with complexity. These costs are almost universally underestimated, if, indeed, they are considered at all, when recharge schemes are instituted. There are also hidden costs -- and cost-avoidances -- to be
considered. The cost-avoidances are easier to estimate; they are simply the costs for the resources that were not needed because chargeback encouraged underuse. The other side of the balance -- the cost to the corporation of the failure to carry out an exploratory application -- can only be determined in retrospect in terms of lost opportunities or reduced market share. Nevertheless, some attempt should be made to estimate it if you really want to know if the game is worth the candle.

Conclusion: When is chargeback counterproductive?

Chargeback is unsuitable, or at least suboptimal, in a corporation that

is entrepreneurial,

has a centralized corporate power structure

with ambiguous lines of authority,

requires central control of corporate data,

has a closed-shop programming environment,

provides financial support for the DP/IS group,

evaluates the DP/IS group upon its success as a service/support function,

has a captive, but cooperative, user community, and

depends for its success upon open-ended, exploratory computing.

The better you match this profile, the more vigorously you should oppose the introduction of chargeback into your DP/IS universe.
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